XGB CPU Modules

CPU Module (with embedded I/O)

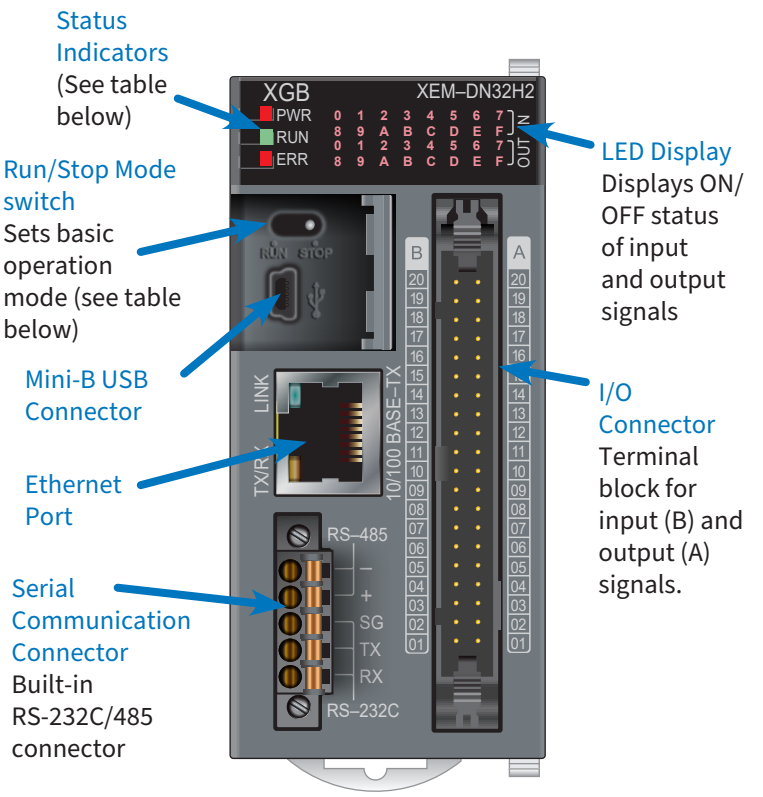
- ***XEM-DN32H2***
- ***XEM-DN32HP***
- ***XEM-DP32H2***
- ***XEM-DP32HP***

The XEM CPU module from LS Electric is the anchor of the XGB PLC series. It is a high performance motion-capable PLC in a small package. The CPU module is equipped with a high performance microprocessor that controls up to 6 axis of position control, high speed I/O, and built in ethernet communications. Optional EtherCAT® motion modules allow control of up to 16 EtherCAT® servo drives.

The XEM CPU is a stand-alone block style PLC. It requires one Smart Link cable and terminal block for wiring the embedded 16 input points and 16 output points. The systems supports 16 built-in PID loops and can be expanded with up to 7 modules.

I/O and memory are assigned direct variables. User-defined symbolic variables can be created for easy reference in the programming.

The PLC offers an advanced level of programming, featuring the IEC61131-3 standard capable of Ladder, Structured Text, Sequential Function Chart and Instruction List. Over 700 advanced Function block instructions, including 80+ motion specific, are available for use in both Ladder and Structured Text programming.



Features

- 16 DC inputs, 16 DC outputs
- (4) 200kHz high speed counters
- 2- or 6-axis motion control (high speed pulse outputs)
- Module expansion supports up to 7 slots
- 22 different option modules available to handle digital, analog, counter input, and communications
- EtherCAT® motion modules offer position control for up to 16 EtherCAT® servo drives
- XG5000 software with IEC 61131 programming languages: Ladder, Structured Text, SFC, and IL. Includes XG-PM software for table-based motion configuration and testing

CPU Status Indicators	
PWR	Red LED is illuminated when power is on.
RUN	Green LED is illuminated when PLC is in RUN mode.
ERR	Red LED is illuminated to indicate program error(s).

CPU RUN/STOP Switch	
RUN position	Executes user program.
STOP position	Normal program load position. Allows for Remote Run from XG5000.

PLC (CPU with I/O) Feature Breakdown

Part Number	*Price*	*Built-in I/O*			*Max Option Cards*	*USB*	*Ethernet*	*RS-232C*	*RS-485*	*Memory Backup*	*Online Editing*	*Drawing*
		Motion Axis	*Inputs*	*Outputs*								
XEM-DN32H2	$299.00	2	16 sink/ source	16 sink	7	Yes (mini-B)	Yes (10/100Base-T)	Yes	Yes	Memory: Non-Volitale RAM RTC: 6 month backup (No battery)	Yes	PDF
XEM-DP32H2	$299.00	2		16 source								PDF
XEM-DN32HP	$349.00	6		16 sink								PDF
XEM-DP32HP	$349.00	6		16 source								PDF

XGB Series PLC - Basic System Setup

Follow the steps below to select and configure the fundamental components needed to get your XEM CPU module up and running. You can also access several quick start video guides here: Building and Powering the LS PLC Rack

1 Select your XEM CPU module, Smart Link cable, and Smart Link terminal block. The Smart Link cable and terminal block are only required if using on board I/O.

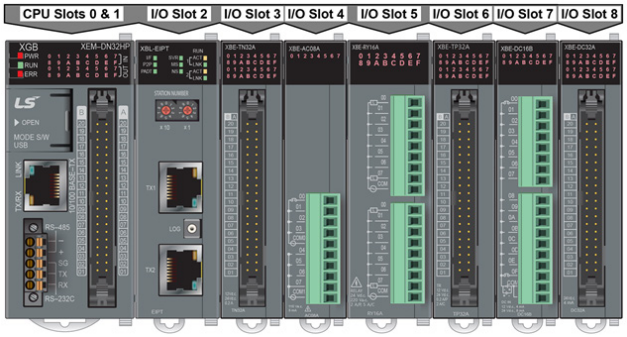
See "Smart Link I/O System" on page tLSE-83 for cable and terminal block part numbers.

Note: Screwdriver size 04/2.5

2 Select and install up to seven option modules. 32-point I/O and counter input modules will require a Smart Link cable and terminal block.

EtherCAT modules must be added to Slot 2 and 3 only.

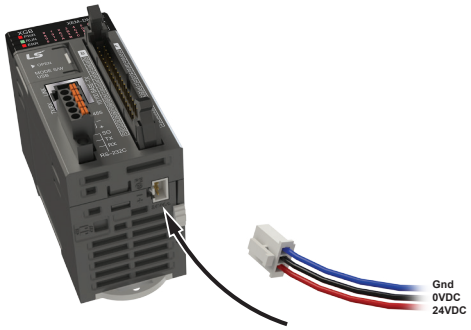
Use the Product Selector to help configure the PLC at automationdirect.com/ls/config.



Note: Screwdriver size 2.5 mm

3 Connect user-supplied 24VDC power. Connect power to the XEM module, then connect power to the XTB-40H terminal block and any installed I/O modules.

Note: XGB-CON-3PX cable pigtail is included with the CPU.



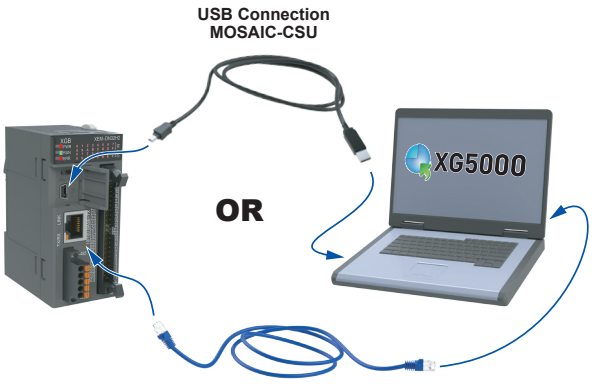
4 Choose programming cable, either a USB connection cable or Ethernet cable.

To connect via USB:

USB Connection to XEM CPU

To connect via Ethernet:

Ethernet Connection to XEM CPU



Performance Specifications, *XEM-DN32H2/HP and XEM-DP32H2/HP*

Specification				Part Number			
				XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Power Specifications	Input	Input Voltage Range		20.4–28.8 VDC (-15% to +20%)			
		Rated Input Voltage		24VDC			
		Input Current		1A or less			
		Efficiency		60% or more			
		Permitted Momentary Power Failure		1ms or less			
	Output	Rated Output Voltage		5VDC (±2%)			
		Output Current		2.0 A			
	Power Supply Status Indication			LED On when power supply is normal			
	Cable Specification			0.75–2 mm^2			
Program Control Method				Cyclic execution of stored program, time-driven interrupt, process-driven interrupt			
I/O Control Method				Batch processing by simultaneous scan (refresh method), directed by program instruction			
Programming Languages				LD (Ladder Diagram), ST (Structured Text), SFC (Sequential Function Chart), IL (Instruction List)			
Programming Instructions	Operator (LD only)			11			
	Extension (LD, ST, IL)			9 (Break, Call, End, For, Jmp, Next, Ret, Sbrt, Init_Done)			
	Function (LD, ST, IL)			400+ (295+ for Data Tpe Conversion)			
	Function Block (LD & ST)			300+ (80+ motion specific)			
	Sequential Function Chart			7			
Special Features/Instructions				User Defined Data Type, User Defined Functions/Function Blocks			
Processing Speed (Basic Instruction)				40ns/step			
Program Capacity				384kb			
Maximum Base Rack I/O Points				(PLC + 7 option cards) Digital: 32(PLC built in) + 224 (32 point IO x 7 slots) = 256 Total Analog: 56 (8 point AI x 7 slots) = 56 total			
Data Area (User Assigned)	Symbolic Variable			64KB (retain selectable by individual variable)			
	Direct Variables		M	32KB (retain configurable - by block)			
			W	64KB (retain)			
Data Area (PLC Reserved)	Input Variables		I	2KB (%IX0.0.0–%IX15.15.63)			
	Output Variables		Q	2KB (%QX0.0.0–%QX15.15.63)			
	Flag Variables		F	4KB			
			K	8KB			
			L	8KB			
			U	0.5 KB			
	P2P Service Variables		N	20KB			
Total Program				256			
Task	Initialization Task			1			
	Cycle Time Task			Max 16			
	I/O Task			Max 8			
	Internal Device Task			Max 16			
	High Speed Counter Task			Max 4			
	Position Control Task			1			
Operation Mode				RUN, STOP, DEBUG			
Self-diagnosis Function				Detects errors of scan time, memory, I/O and power supply			
Program Port				USB Mini-B type, USB 1 channel			
Retain Area Setup				Retain area setting in basic parameter			
Internal Consumption Current				540mA			
Weight				134g (4.73 oz)			

Built-in Functions, *XEM-DN32H2/HP and XEM-DP32H2/HP*

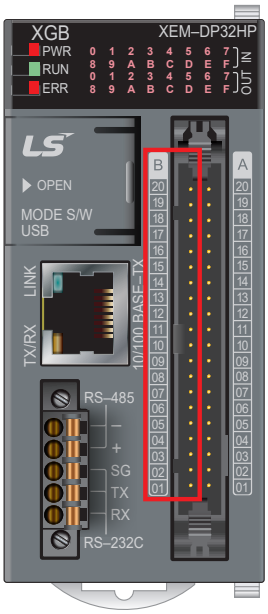
Specification			Part Number			
			XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Number of Motion Control Axis			2-axis		6-axis	
Interpolation Function			• 2-axis linear interpolation • 2-axis circular interpolation		• 2/3/4/5/6 axis linear interpolation • 2-axis circular interpolation • 3-axis helical interpolation	
High Speed Counter	Performance	1 phase	200kHz			
		2 phase	100kHz			
	Channels	1 phase	4 channels			
		2 phase	2 channels			
	Counter Mode		4 counter modes are supported: • Single pulse counter mode with 1 pulse input • Pulse and direction counter mode with 2 pulse inputs • CW/CCW counter mode with 2 pulse inputs • Quadrature (Phase A/B) counter mode with 2 pulse inputs			
	Function		Internal/external preset, Latch counter, Compare output, Number of rotations per unit time			
High Speed Pulse Output Motion Control	Basic Function	Control Method	Position control, Speed control, Speed/Position control, Position/Speed control			
		Control Unit	Pulse, mm, inch, degree			
		Position Data	400 steps for each axis (1–400)			
		Operation Mode	End, Keep, Continuous			
		Operation Method	Single, Repeat			
	Position	Control	Absolute method/Incremental method			
		Address Range	-2,147,483,648 – 2,147,483,647 (Pulse)			
		Speed	200kHz max			
		Acc/Dec Processing	Trapezoid-shaped, S-curve			
	Homing Method		DOG+HOME (Off), DOG+HOME (On), Upper/Lower limit + HOME, DOG, High speed, Upper/Lower limit, HOME			
	Jog Operation		Jog operation, Inching operation, Manual Pulse Generator operation			
Pulse Catch			10μs 4-point (%IX0.0.0–%IX0.0.3), 50μs 4-point (%IX0.0.4–%IX0.0.7)			
External Point Interrupt			10μs 4-point (%IX0.0.0–%IX0.0.3), 50μs 4-point (%IX0.0.4–%IX0.0.7)			
Input Filter			1,3,5,10,20,70,100 ms			
PID Control			Max. 16 PID loops, Control by instruction, Auto-tuning, PWM output, Forced output, Operation scan time setting, Antiwindup, Delta MV, SV lamp, Hybrid operation, Cascade operation			
Serial (Cnet)	Protocol		Modbus RTU/ASCII, XGT Dedicated, User-defined			
	Channel		1 RS-232C port, 1 RS-485 port			
Ethernet (FEnet)	Transfer Spec		Cable: 100Base-TX, Speed: 100Mpbs, Auto-MDIX[1], IEEE 802.3			
	Topology		Star			
	Diagnosis		Module information, Service condition			
	Protocol/Usage		Modbus TCP/IP Client and Server, Email (SMTP client), XGT dedicated, User Define frame, Programming/Online Monitoring			
	Channel		1 port 10/100MB Ethernet			
	Service		P2P, High Speed link, Remote connection, SMTP, SNTP, Auto scan			

1 - Auto-MDIX (Automation medium-dependent interface crossover) automatically detects whether the cable connected to the Ethernet port is peer-to-peer (straight) or crossover cable.

Digital Input Specifications, *XEM-DN32H2/HP and XEM-DP32H2/HP*

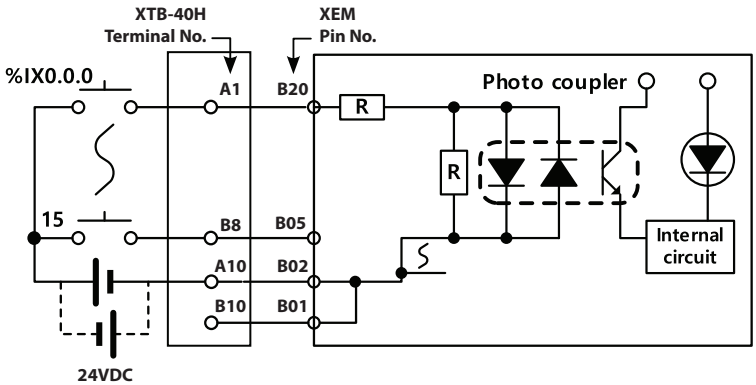
16-point 24VDC Input (Sink/Source Type) Specifications

Model	XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Input Point	16 point			
Insulation Method	Photocoupler Insulation			
Rated Input Volage	24VDC			
Rated Input Current	~4mA (Inputs 0–3 about 7mA)			
Operation Voltage Range	20.4–28.8 VDC (within ripple rate 5%)			
On Voltage	19VDC or higher			
On Current	3mA or higher			
Off Voltage	6VDC or less			
Off Current	1mA or less			
Input Resistance	About 5.6 kΩ (Inputs 0–7 about 4.7 kΩ)			
Response Time (Off → On / On → Off)	1/3/4/10/20/70/100 ms (set by I/O parameter) Default: 3ms			
Insulation Pressure	AC560Vrms / 3 cycle (altitude 2000m)			
Insulation Resistance	100MΩ or more by MegOhmMeter			
Common Method	16 point / COM			
Proper Cable Size	0.3 mm²			
Operation Indicator	LED On when Input On			
External Connection Method	40 point connector			



Note: Red box highlights pins of the CPU inputs.

16-point 24VDC Input (Sink/Source Type) Circuit Configuration

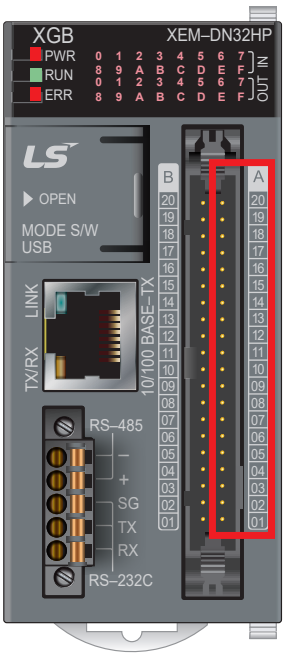


XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description
A1	B20	%IX0.0.0	High Speed Counter Inputs 1 phase- 200kpps 4 channel 2 phase- 100kpps 2 channel or General Input
B1	B19	%IX0.0.1	
A2	B18	%IX0.0.2	
B2	B17	%IX0.0.3	
A3	B16	%IX0.0.4	Preset Input or General Input
B3	B15	%IX0.0.5	
A4	B14	%IX0.0.6	
B4	B13	%IX0.0.7	
A5	B12	%IX0.0.8	General Input
B5	B11	%IX0.0.9	General Input
A6	B10	%IX0.0.10	General Input
B6	B09	%IX0.0.11	General Input
A7	B08	%IX0.0.12	General Input
B7	B07	%IX0.0.13	General Input
A8	B06	%IX0.0.14	General Input
B8	B05	%IX0.0.15	General Input
A9	B04	–	Not used (NC)
B9	B03	–	Not used (NC)
A10	B02	–	Common
B10	B01	–	Common

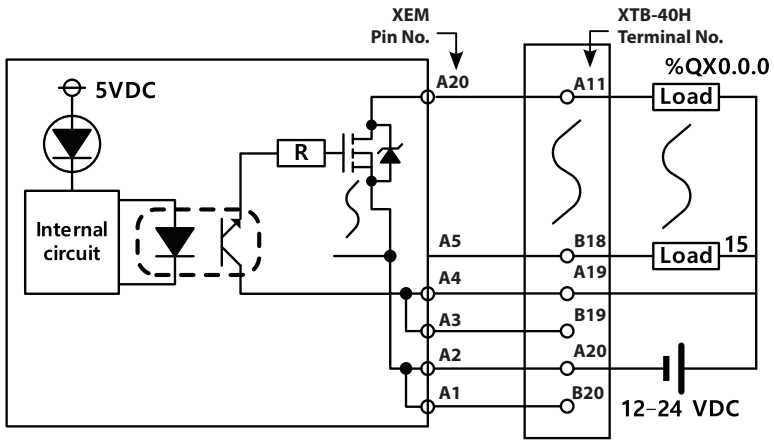
Digital Output Specifications, *XEM-DN32H2 and XEM-DN32HP*

16-point Transistor Output (Sink Type)Specifications

Model		XEM-DN32H2	XEM-DN32HP
Input Point		16 point	
Insulation Method		Photocoupler Insulation	
Rated Load Volage		12VDC / 24VDC	
Operation Load Voltage Range		10.2–26.4 VDC	
Max. Load Current		%QX0.0.0–11: 0.1A / 1-point, %QX0.0.12–15: 0.5 A/ 1-point, 2A / 1COM	
Off Leakage Current		0.1 mA or less	
Max. Inrush Current		4A / 10ms or less	
Max. Voltage Drop when On		0.4 VDC or less	
Over Voltage Protection		TVS diode	
Response Time	Off → On	1ms or less	
	On → Off	1ms or less (rated load, resistive load)	
Common Method		16-point / COM	
Proper Wire Size		Stranded wire, 0.3–0.75 mm^2 (external diameter 2.8 mm or less)	
External Power	Voltage	12VDC / 24VDC ± 10% (ripple voltage 4 Vp-p or less)	
	Current	80mA or less (when connecting 24VDC)	
Operation Indicator		LED On when Output On	
External Connection Method		40-point connector	



16-point Transistor Output (Sink Type) Circuit Configuration



Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description	
	A11	A20	%QX0.0.0	Pulse- Axis1 or General Output 0.1A/pt	
	B11	A19	%QX0.0.1	Pulse- Axis2 or General Output 0.1A/pt	
	A12	A18	%QX0.0.2	Pulse- Axis3* or General Output 0.1A/pt	
	B12	A17	%QX0.0.3	Pulse- Axis4* or General Output 0.1A/pt	
	A13	A16	%QX0.0.4	Pulse- Axis5* or General Output 0.1A/pt	
	B13	A15	%QX0.0.5	Pulse- Axis6* or General Output 0.1A/pt	
	A14	A14	%QX0.0.6	Direction- Axis 1 or General Output 0.1A/pt	
	B14	A13	%QX0.0.7	Direction- Axis 2 or General Output 0.1A/pt	
	A15	A12	%QX0.0.8	Direction- Axis 3* or General Output 0.1A/pt	
	B15	A11	%QX0.0.9	Direction- Axis 4* or General Output 0.1A/pt	
	A16	A10	%QX0.0.10	Direction- Axis 5* or General Output 0.1A/pt	
	B16	A09	%QX0.0.11	Direction- Axis 6* or General Output 0.1A/pt	
	A17	A08	%QX0.0.12	General Outputs - 0.5A/pt	
	B17	A07	%QX0.0.13	General Outputs - 0.5A/pt	
	A18	A06	%QX0.0.14	General Outputs - 0.5A/pt	
	B18	A05	%QX0.0.15	General Outputs - 0.5A/pt	
	A19	A04	–	P (24VDC)	2.0A/common
	B19	A03	–	P (24VDC)	
	A20	A02	–	OUT_COM	
	B20	A01	–	OUT_COM	

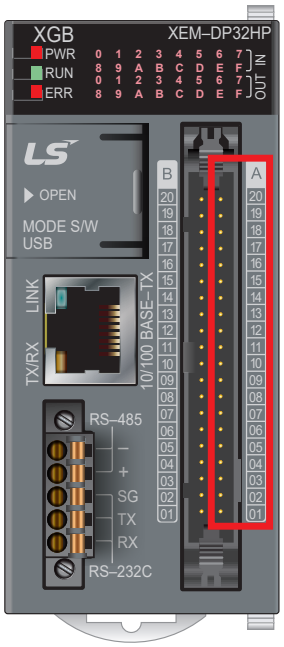
* Note: DN32HP module only

XGB CPU Modules

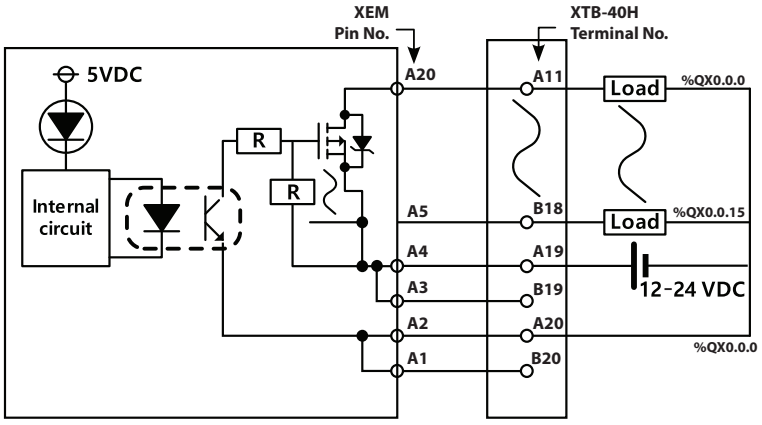
Digital Output Specifications, *XEM-DP32H2 and XEM-DP32HP*

16-point Transistor Output (Source Type) Specifications

Model		XEM-DP32H2	XEM-DP32HP
Input Point		16 point	
Insulation Method		Photocoupler Insulation	
Rated Load Volage		12VDC / 24VDC	
Operation Load Voltage Range		10.2–26.4 VDC	
Max. Load Current		**%QX0.0.0–11:** 0.1A / 1-point **%QX0.0.12–15:** 0.5 A/ 1-point, 2A / 1COM	
Off Leakage Current		0.1 mA or less	
Max. Inrush Current		4A / 10ms or less	
Max. Voltage Drop when On		0.4 VDC or less	
Over Voltage Protection		TVS diode	
Response Time	Off → On	1ms or less	
	On → Off	1ms or less (rated load, resistive load)	
Common Method		16-point / COM	
Proper Wire Size		Stranded wire, 0.3–0.75 mm^2 (external diameter 2.8 mm or less)	
External Power	Voltage	12VDC / 24VDC ± 10% (ripple voltage 4 Vp-p or less)	
	Current	50mA or less (when connecting 24VDC)	
Operation Indicator		LED On when Output On	
External Connection Method		40-point connector	



16-point Transistor Output (Source Type) Circuit Configuration



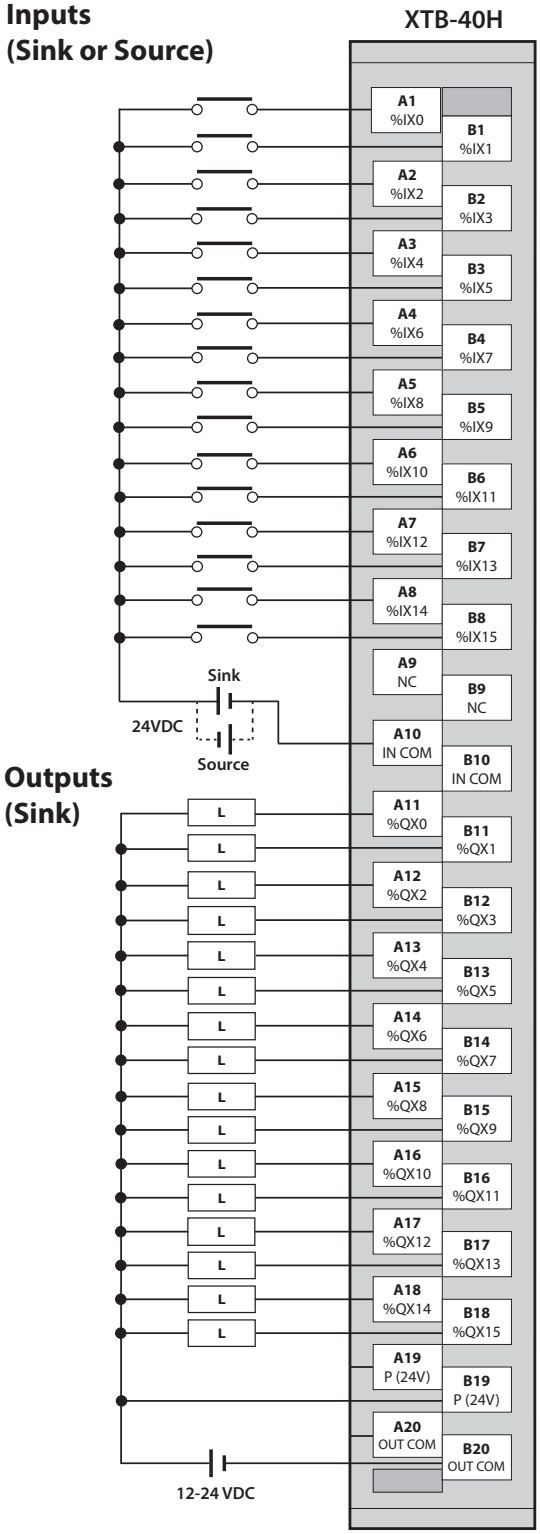
Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description	
	A11	A20	%QX0.0.0	Pulse- Axis1 or General Output 0.1A/pt	
	B11	A19	%QX0.0.1	Pulse- Axis2 or General Output 0.1A/pt	
	A12	A18	%QX0.0.2	Pulse- Axis3* or General Output 0.1A/pt	
	B12	A17	%QX0.0.3	Pulse- Axis4* or General Output 0.1A/pt	
	A13	A16	%QX0.0.4	Pulse- Axis5* or General Output 0.1A/pt	
	B13	A15	%QX0.0.5	Pulse- Axis6* or General Output 0.1A/pt	
	A14	A14	%QX0.0.6	Direction- Axis 1 or General Output 0.1A/pt	
	B14	A13	%QX0.0.7	Direction- Axis 2 or General Output 0.1A/pt	
	A15	A12	%QX0.0.8	Direction- Axis 3* or General Output 0.1A/pt	
	B15	A11	%QX0.0.9	Direction- Axis 4* or General Output 0.1A/pt	
	A16	A10	%QX0.0.10	Direction- Axis 5* or General Output 0.1A/pt	
	B16	A09	%QX0.0.11	Direction- Axis 6* or General Output 0.1A/pt	
	A17	A08	%QX0.0.12	General Outputs - 0.5A/pt	
	B17	A07	%QX0.0.13	General Outputs - 0.5A/pt	
	A18	A06	%QX0.0.14	General Outputs - 0.5A/pt	
	B18	A05	%QX0.0.15	General Outputs - 0.5A/pt	
	A19	A04	–	OUT_COM	2.0A/common
	B19	A03	–	OUT_COM	
	A20	A02	–	N (0VDC)	
	B20	A01	–	N (0VDC)	

*** Note: DP32HP module only**

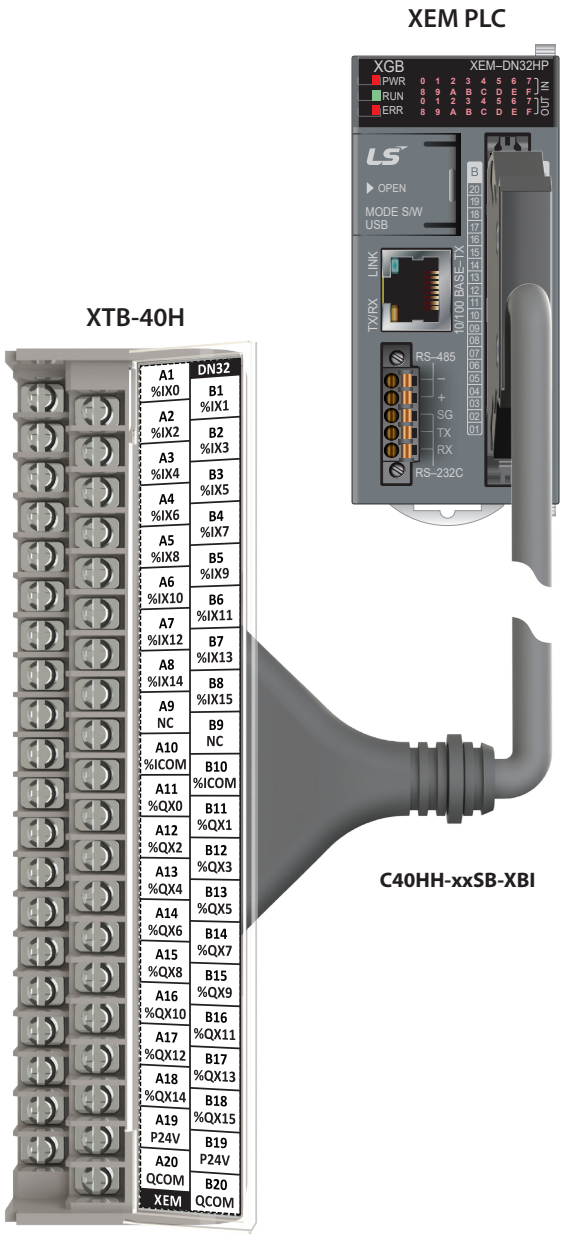
PLC I/O Wiring (Sinking Outputs), *XEM-DN32H2/HP*

Download module specific XTB-40H Terminal Label Printouts here: Download Printouts

Terminal Wiring



PLC Connection



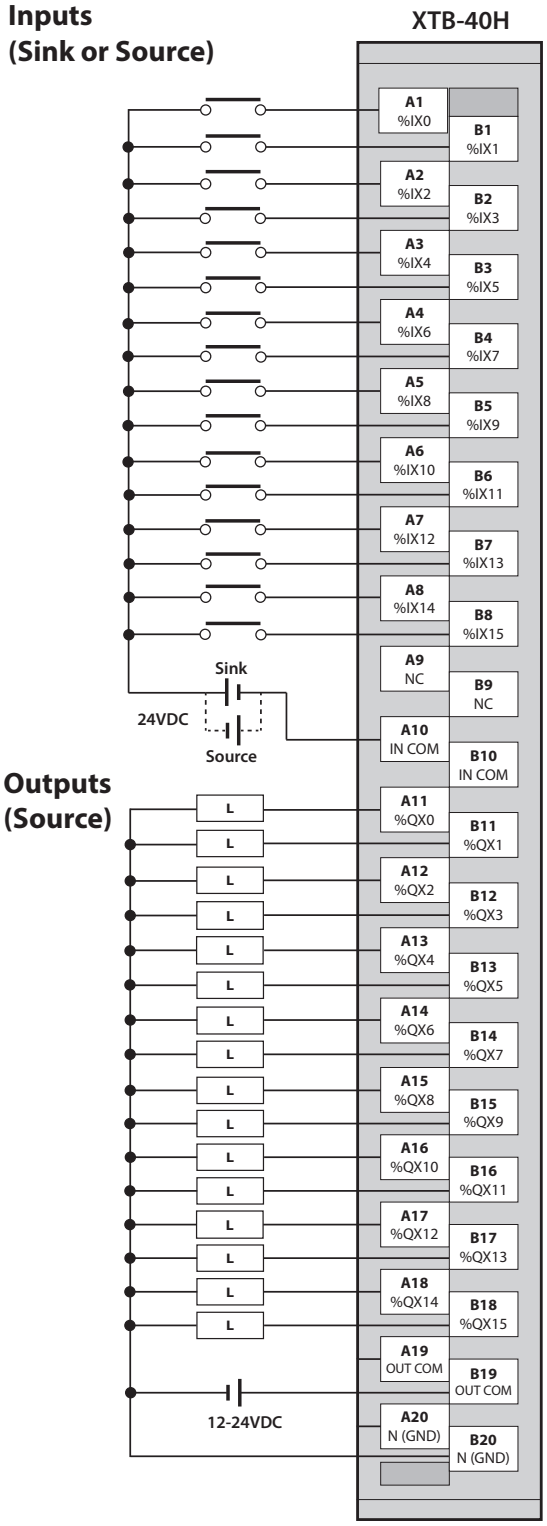
Note:

- Wiring: AWG22-16 (1.5mm^2/MAX)
- Screw: M3 X 8L
- Screw Torque: 1.2 N·m (12kgf·cm)

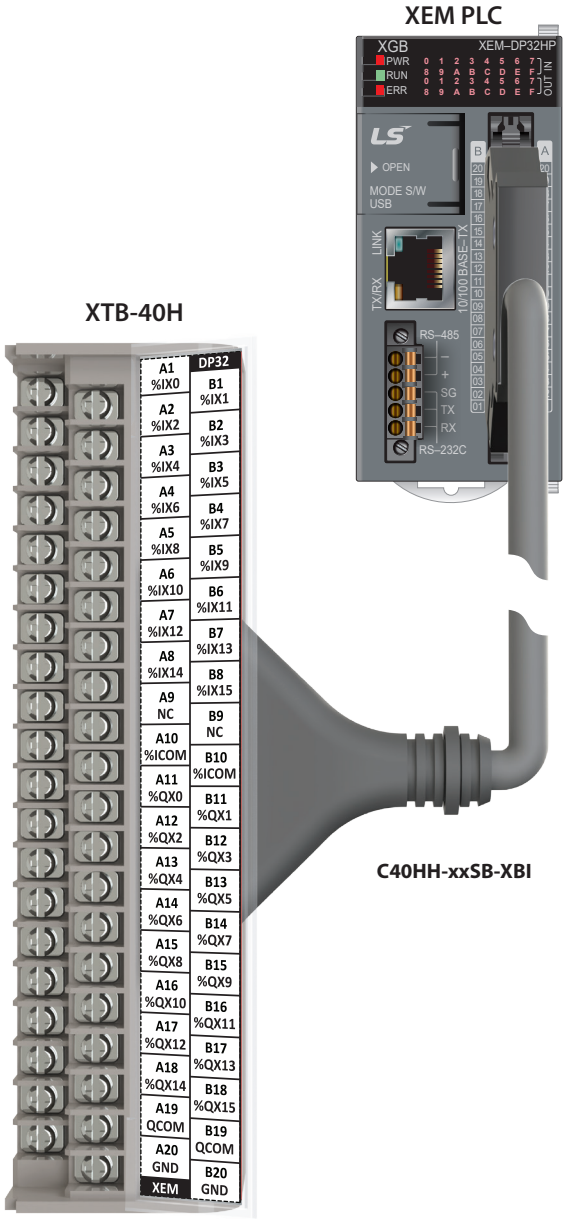
PLC I/O Wiring (Sourcing Outputs), *XEM-DP32H2/HP*

Download module specific XTB-40H Terminal Label Printouts here: Download Printouts

Terminal Wiring



PLC Connection

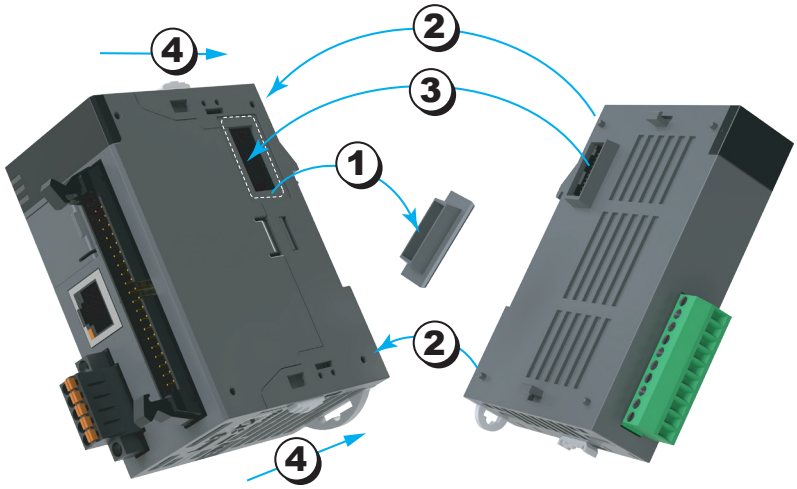


Note:

- Wiring: AWG22-16 (1.5mm^2/MAX)
- Screw: M3 X 8L
- Screw Torque: 1.2 N·m (12kgf·cm)

I/O Module Installation

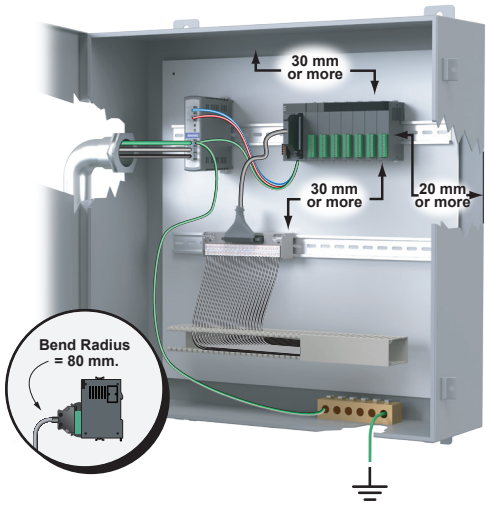
Attach each I/O module to the PLC per the diagram to the right. Up to seven modules can be attached by hooking in to each expansion module in the same manner. Any 32-point I/O and counter input module will require a Smart Link cable and terminal block. Use the online Product Selector to help configure the PLC at automationdirect.com/ls/config.



1. Remove expansion port cover.
2. Align tabs with corresponding holes.
3. Seat the expansion port connector.
4. Secure modules with top and bottom sliding lock.

Mounting the PLC

When mounting the completed PLC module to your structure, keep the distances shown in the diagram below to maintain proper ventilation and allow easy detachment and attachment.



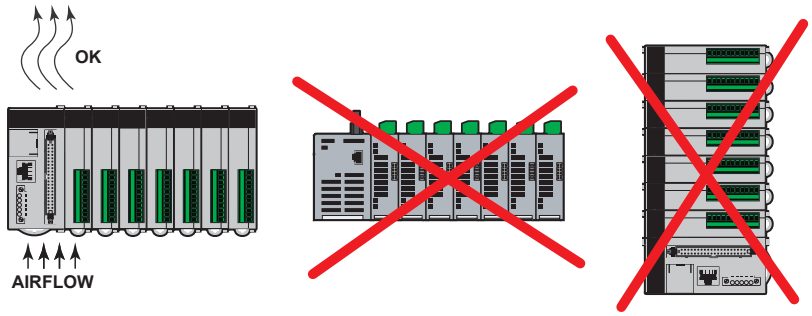
Additional Clearance Distances:

- Wire duct on the side requires 5mm or more
- Panel wall on the side requires 20mm or more
- Another device on the side requires 50mm or more

DIN Rail Mounting

The PLC has a hook for DIN rail mounting (35mm). To mount to DIN rail:

- Pull the hook as shown below at the bottom of module and install it at the DIN rail.
- Push the hook to fix the module to the rail after installing.



Environmental Specifications, all XGB Series Modules

Item				Specification	Reference
Ambient Operating Temperature				0–55°C (32–131°F)	–
Storage Temperature				-25–70°C (-13–158°F)	
Ambient Operating Humidity				5–95% relative humidity (non-condensing)	
Storage Humidity				5–95% relative humidity (non-condensing)	
Vibration[1]	Occasional Vibration	Frequency	5 ≤ f < 8.4 Hz	3.5 mm pulse width	IEC61131-3-2
			8.4 ≤ f < 150Hz	9.8 m/s^2 (1G)	
	Continuous Vibration		5 ≤ f < 8.4 Hz	1.75 mm pulse width	
			8.4 ≤ f < 150Hz	4.9 m/s^2 (0.5G)	
Shocks			Peak Acceleration	147 m/s^2 (15G)	
			Duration	11ms	
			Pulse Wave Type	Half-sine (3 times each direction per each axis)	
Noise Resistance	Square Wave Impulse Noise			1,500VAC 900VDC	LS Electric standard
	Electrostatic Discharge			Voltage: 4kV (contact discharge)	IEC61131-3-2 IEC61000-4-2
	Radiated Electromagnetic Field Noise			80–1,000 MHz, 10 V/m	IEC61131-3-2 IEC61000-4-3
	Fast Transient / Burst Noise		Classification	Voltage	IEC61131-3-2 IEC61000-4-4
			Power Supply	2kV	
			Digital/Analog Input/Output Communication Interface	1kV	
Environment				Free from corrosive gases and excessive dust	–
Attitude				Less than 2,000m	
Pollution Degree				Less than 2 (see note 2)	
Cooling Method				Air-cooling	

1 - Vibration of 10 times each direction (X, Y, and Z)
2 - Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

LS ELECTRIC

XGB Series PLC Family

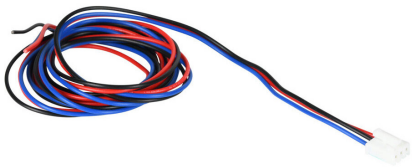
Available I/O Modules

XGB Series I/O Modules								
Part Number	Price	Description	Digital Input	Digital Output	Analog Input	Analog Output	Motion	Smart Link Cable and Terminal Required
Digital								
XBE-DC16A	$70.00	LS Electric XGB discrete input module, 16-point, 24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	✓					
XBE-DC16B	$78.00	LS Electric XGB discrete input module, 16-point, 12-24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	✓					
XBE-DC32A	$97.00	LS Electric XGB discrete input module, 32-point, 24 VDC, sinking/sourcing, 1 common(s), 32 point(s) per common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	✓					✓
XBE-AC08A	$88.00	LS Electric XGB discrete input module, 8-point, 120 VAC, 2 common(s), 4 point(s) per common. Removable terminal blocks included.	✓					
XBE-RY08B	$95.00	LS Electric XGB relay output module, 8-point, 125 VDC/250 VAC, (8) Form A, 8 isolated common(s), 1 point(s) per common, 2A/point. Removable terminal blocks included.		✓				
XBE-RY16A	$110.00	LS Electric XGB relay output module, 16-point, 125 VDC/250 VAC, (16) Form A, 2 isolated common(s), 8 point(s) per common, 2A/point, 5A/common. Removable terminal blocks included.		✓				
XBE-TN16A	$78.00	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sinking, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				
XBE-TN32A	$109.00	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sinking, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.		✓				✓
XBE-TP16A	$88.00	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sourcing, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				
XBE-TP32A	$93.00	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sourcing, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.		✓				✓
XBE-DN32A	$172.00	LS Electric XGB discrete combo module, Input: 16-point, 24 VDC, sinking/sourcing, Output: 16-point, 12-24 VDC, sinking, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	✓	✓				✓
Analog								
XBF-AD04A	$160.00	LS Electric XGB analog input module, 4-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-10 VDC, external 24 VDC required.			✓			
XBF-AD08A	$242.00	LS Electric XGB analog input module, 8-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, external 24 VDC required.			✓			
XBF-AD04C	$231.00	LS Electric XGB analog input module, 4-channel, current/voltage, 14-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, +/- 10 VDC, external 24 VDC required.			✓			
XBF-DV04A	$152.00	LS Electric XGB analog output module, 4-channel, voltage, 12-bit, output voltage signal range(s) of 0-10 VDC, external 24 VDC required.				✓		
XBF-DV04C	$209.00	LS Electric XGB analog output module, 4-channel, voltage, 14-bit, output voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC and +/- 10 VDC, external 24 VDC required.				✓		
XBF-DC04A	$162.00	LS Electric XGB analog output module, 4-channel, current, 12-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.				✓		
XBF-DC04C	$209.00	LS Electric XGB analog output module, 4-channel, current, 14-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.				✓		
XBF-AH04A	$216.00	LS Electric XGB analog combo module, Input: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC, Output: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC.			✓	✓		
Motion								
XBF-PN04B	$350.00	LS Electric XGB 4-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.					✓	
XBF-PN08B	$395.00	LS Electric XGB 8-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.					✓	
XBF-HO02A	$176.00	LS Electric XGB counter input module, 200 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, single-ended encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.					✓	✓
XBF-HD02A	$253.00	LS Electric XGB counter input module, 500 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, differential encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.					✓	✓
Communication								
XBL-EIPT	$199.00	LS Electric XGB communication module, EtherNet/IP, 2 ports, (2) Ethernet 10/100Base-T (RJ45) port(s). For use with LS Electric XGB series PLCs.						

Note: See "Smart Link I/O System" on page tLSE-83 for the XTB-40H terminal block and cables. See "XGB PLC Replacement Terminals" on page tLSE-82 for replacement removable terminal blocks.

XGB PLC Replacement Terminals

Part Number	Price	Function	Description	Compatible With
XGB-CON-3PX	$4.00	LS XEM Processor Power 3 pole , Tab Lock, Assembly Connector & Wire	LS Electric XGB terminal block, 3-pin with cable pigtail, replacement. For use with LS Electric XEM-Dx32Hx PLCs.	XEM-DN32H2, XEM-DN32HP, XEM-DP32H2, XEM-DP32HP
XGB-CON-5PX	$4.00	LS XEM Processor Serial Communication 5 Pole, Screw Lock	LS Electric XGB terminal block, 5-pin spring clamp, replacement. For use with LS Electric XEM-Dx32Hx PLCs.	XEM-DN32H2, XEM-DN32HP, XEM-DP32H2, XEM-DP32HP
XGB-CON-8P	$5.00	LS XGB PLC IO Connector 8 Pole	LS Electric XGB terminal block, 8-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-DC16A, XBE-DC16B, XBE-TN16A, XBE-TP16A, XBF-AD08A
XGB-CON-9P	$6.00	LS XGB PLC IO Connector 9 Pole	LS Electric XGB terminal block, 9-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-RY08B, XBE-RY16A
XGB-CON-10P	$6.00	LS XGB PLC IO Connector 10 Pole	LS Electric XGB terminal block, 10-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-DC16A, XBE-DC16B, XBE-TN16A, XBE-TP16A, XBF-AD08A, XBE-AC08A
XGB-CON-11P	$6.00	LS XGB PLC IO Connector 11 Pole	LS Electric XGB terminal block, 11-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBF-AD04A , XBF-AH04A, XBF-DV04A, XBF-DV04C, XBF-DC04A, XBF-DC04C
XGB-CON-15P	$7.00	LS XGB PLC IO Connector 15 Pole	LS Electric XGB terminal block, 15-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBF-AD04C



XGB-CON-3PX

XGB-CON-9P

XGB-CON-15P

Smart Link I/O System

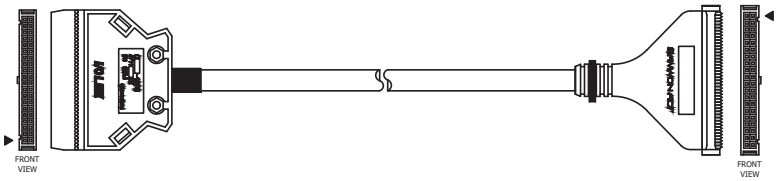
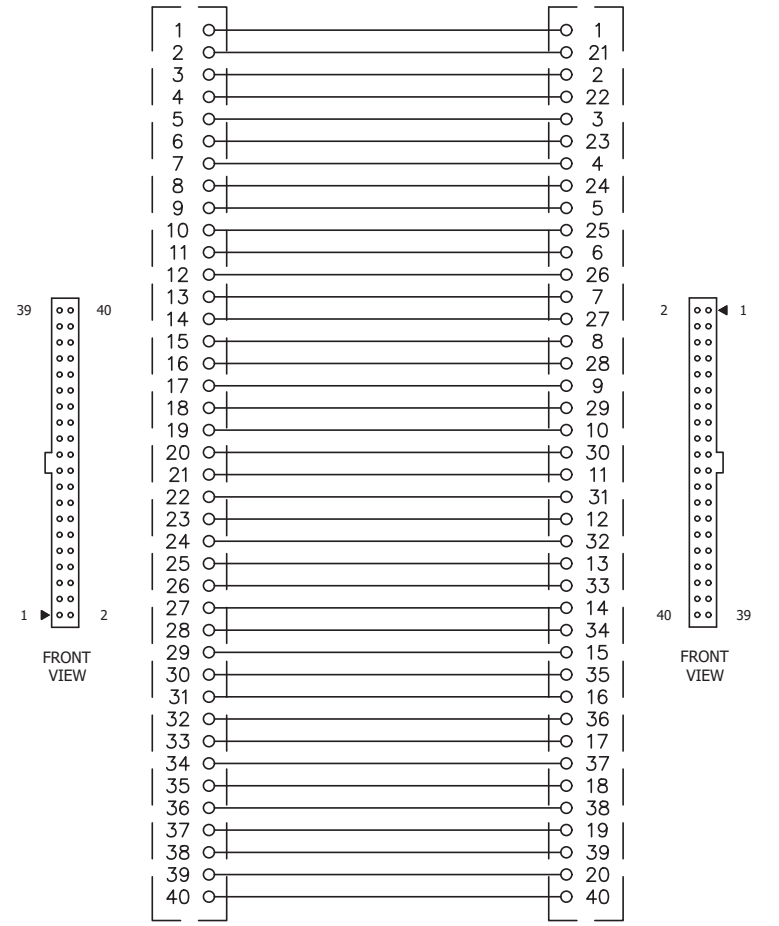
The Smart Link I/O system is a breakout wiring system used for high density I/O modules in the LS Electric XGB PLC series. The system is required for all modules with a 40-pin connection, and consists of a Smart Link cable with an XTB-40H terminal block.

Download module specific XTB-40H Terminal Label Printouts here: Terminal Printouts

Part Number	Price	Description	Length	Compatible With
XTB-40H	$20.00	LS Electric XGB terminal block, 40-pin screw type. For use with LS Electric XGB series high-density modules.	n/a	All LS XGB series PLCs and modules with 40-pin connectors
C40HH-05SB-XBI	$22.00	LS Electric XGB PLC I/O cable, 1.6ft/0.5m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	0.5 m	
C40HH-10SB-XBI	$25.00	LS Electric XGB PLC I/O cable, 3.2ft/1m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	1m	
C40HH-15SB-XBI	$29.00	LS Electric XGB PLC I/O cable, 4.9ft/1.5m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	1.5 m	
C40HH-20SB-XBI	$36.00	LS Electric XGB PLC I/O cable, 6.5ft/2m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	2m	
C40HH-30SB-XBI	$42.00	LS Electric XGB PLC I/O cable, 9.8ft/3m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	3m	

XTB-40H Specifications		
Number of Pins		40 pin
Terminal Pitch		7.0 mm
Connector Type		MIL-C-83503 (50P polarity guide: 2EA)
Applicable Wires		AWG22–16 (1.5mm^2/MAX)
Insulation Resistance		100MΩ (500VDC)
Dielectric Strength		500VAC 1 minute
Screw		M3 x 8L
Screw Torque		1.2N•m (12kgf•cm)
Ambient Temperature		-10ºC to +50ºC (no freezing)
Material	Case	Modified PPO
	Protective Cover	Polycarbonate
	PCB	Epoxy 1.6t

Smart Link I/O System, Terminals and Cable Connections

Module to Cable to Terminal Pinouts		
Module Pins	**C40HH-xxSB-XBI**	**XTB-40H Terminal**
B20		A1
B19		B1
B18		A2
B17		B2
B16		A3
B15		B3
B14	HIROSE HIF3BA-40D-2.54R HIROSE HIF3BA-40D-2.54R	A4
B13		B4
B12		A5
B11		B5
B10		A6
B09		B6
B08		A7
B07		B7
B06		A8
B05		B8
B04		A9
B03		B9
B02		A10
B01		B10
A20		A11
A19		B11
A18		A12
A17		B12
A16		A13
A15		B13
A14		A14
A13		B14
A12		A15
A11		B15
A10		A16
A09		B16
A08		A17
A07		B17
A06		A18
A05		B18
A04		A19
A03		B19
A02		A20
A01		B20